Our ref: KOY-18 Client's ref: F0973-US

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	N. SASA	Art Unit: 1712
Appln. No. :	10/774,733	Examiner: R. E. Sellers
Filed :	February 9, 2004	
Title :	ACTIVE ENERGY RAY CURABLE COMPOSITION	Confirmation #9205

DECLARATION

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

S i r:

I, Nobumasa Sasa, hereby declare and state as follows:

1. I am the named Inventor in this Application.

2. I received a Masters Degree in Technology in March of 1976 from Chiba University of Chiba, Japan. Since April of 1996, I have been employed by Konica Corporation, now Konica Minolta Medical & Graphic, Inc. owner of this Application. Since my employment with Konica, I have been engaged in research

and study of photosensitive materials in the research and development laboratory of the Company. I am familiar with the subject matter of this Application.

3. I am aware that this Application has been rejected based on European Patent No. 118748 and U.S. Patent Publication No. 2004/0242839 (Takai). I have read both EP '748 and Takai and have performed tests which are reported herein to demonstrate the difference between the composition made in accordance with this Application having methyl groups located at the root of the epoxy group of each oxirane ring compared to epoxy compounds such as the ones taught in EP '748 and Takai, without a methyl group at the root of each oxirane ring. The tests, as reported herein, were performed by me or under my direct supervision and control.

4. Thirteen (13) identical ink compositions were prepared each using a different type of epoxy compound. Each composition contained the following components in the listed amount.

Component	Parts by weight
Pigment 1	5
Epoxy	25
OXT 221	60

Component	Parts by weight
Solsperse 3200	3
SP-1	7

Pigment 1 is a copper based pigment prepared in accordance with this Application as taught in the paragraph bridging pages 61-62. The type of epoxy compound used in each ink composition is recited in the Table A, attached hereto. I chose Epoxy 1 (3,4-epoxycyclohexylmethyl-3-4-epoxycyclohexane carboxylate) and Epoxy 2 (bis(3,4-epoxycyclohexylmethyl)adipate), as recited on page 15 of EP '748, as typical compounds that fall within the teachings of EP '748 and Takai wherein no methyl group is present at the root of the oxirane ring. I chose ten (10) epoxy compounds as recited in this Application on pages 11-13 and 19-25. The relationship between these ten epoxy compounds and general formulas (2) and (3) of this Application is also shown in Table A. I also chose Celloxide 3000 as a comparative since it is recited in the Application as a comparative epoxy compound. OXT 221 is an oxetane ring containing compound. Solsperse 3200 is a pigment dispersant. SP-1 is an initiator. The procedure of Example 2, as recited on page 69, was followed to make the active energy ray curable compositions.

5. Nine (9) different tests were performed on each ink composition and one (1) test was performed on each epoxy. The results of each test are reported in Table A. The procedure for each Test is outlined below.

SAFETY

Chemicals, such as ink and epoxys, are conventionally tested by applying them to the skin and visually observing for skin irritation. In these tests, both the ink and the epxoy were applied to the skin of a single individual and that individual's reaction to the ink and epoxy was observed. The evaluation criteria were as follows:

A - Virtually no change in skin

B - Noticeable reddening of the skin

C - Welts or blisters appeared

STABILITY

Each ink composition was tested for viscosity after initially being made and was then stored in a sealed container at 25°C for one month. After storage, each ink composition was observed visually for precipitation. If there was no precipitation, then the viscosity of the ink was tested to see if it had changed. Viscosity, initially and after storage, was

tested in the same manner using the same equipment and test parameters. The test results reported in Table A are:

A - No precipitation and less than a 10% viscosity change between initial viscosity and viscosity after one month storage.

B - Precipitation

CURABILITY

Following Cure Method 1, as recited on page 74 of this Application (Cure Method 1), three samples of each ink were cured at different temperatures and humidity as shown in Table A. In order to determine whether the ink had fully cured under each of the temperature and humidity conditions, an aluminum plate weighing 1g and having a surface area of 10 mm^2 was placed on the current composition. An additional 1g weight was placed on the plate, softly. After 10 seconds, the weight and the aluminum plates were removed and the aluminum plate was observed to see if any ink adhered to the aluminum plate. The amount of energy needed to prevent the ink from adhering to the aluminum plate was noted and recorded in Table A. The units of the energy reported in Table A are mj/cm^2.

FILM STRENGTH

A cured sample of ink, Curing Method 1, was tested using a scratch strength tester HEIDON-18, made by HEIDON INC. In this test, a sapphire needle of 0.8 mm radius was used. The test entails pulling the needle across the surface of the cured ink for a length of 10 cm using different weights. A weight in grams was placed as a downward force on the needle as the needle was dragged across the surface of the cured ink. The weight in grams at which the needle scratched the cured ink was recorded and is recited in Table A. Scratching is defined as the needle cutting through the cured ink and making contact with the steel plate. The larger the load, the stronger the film.

SOLVENT RESISTANCE AND WATER RESISTANCE

Samples of each ink was cured following Curing Method 1. Then a 1 cm x 1 cm samples was cut and removed from the steel plate. For solvent resistance, a cured ink sample was placed in ethyl alcohol at 50°C for 10 seconds. For Water Resistance, a cured sample was placed in 50°C water for 10 seconds.

After ten (10) seconds, each sample was removed from the liquid and its length and width was measured for change in either direction. Table A lists the result.

6. I find the results, as reported in Table A, to be surprising and unexpected because, as one of skill in the art, I would not expect the fact that methyl groups present at the root of each of the epoxy compounds to result in such a vast improvement based on the teachings of both Takei and EP '748, both of which I have read and both of which I fully understand.

7. I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 USC 1001 and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Nobumasa Sasa

Nobumasa Sasa

Dated: This 8th day of December, 2006.

DCL/mr

Encl: Table A

TABLE A

No.	Epoxy	Relation With General Formula		Safety		Stability	Curability			Curing Method	Film Strength (9)	Solvent Resistance	Water Resistance
				Epoxy Compound	Composition		25 ℃, 45%RH	25 ℃, 85%RH	35 ℃, 55%RH				
1	Example Compound 4	(2)	p1=q1=0	A	A	A	40	40	80	1	400	NC	NC
2	Example Compound 21	(2)	p1=q1=0	A	A	A	30	30	70	1	400	NC	NC
3	Example Compound 1	(2)	p1=1, q1=0 (p1=0, q1=1)	A	A	A	50	50	100	1	400	NC	NC
4	Example Compound 7	(2)	p1=q1=1	A	A	A	50	50	100	1	400	NC	NC
5	EP-9	(2)	p1=q1=1	A	A	A	50	50	100	1	400	NC	NC
6	EP-12	(2)	p1=q1=1	A	A	A	50	50	100	1	400	NC	NC
7	EP-17	(2)	p1=q1=1	A	A	A	50	50	100	1	400	NC	NC
8	EP-31	(3)	p2=q2=0	A	A	A	50	50	100	1	400	NC	NC
9	EP-35	(3)	p2=q2=1	A	A	A	30	30	70	1	400	NC	NC
10	EP-40	(3)	p2=1, q2=0 (p2=0, q2=1)	A	A	A	30	30	70	1	400	NC	NC
11	Celloxide 3000	Comparison example		C	B	B	200	500	1000	1	100	1	2
12	EP' 748 epoxy 1	Comparison example		C	B	B	200	500	1000	1	100	1	2
13	EP' 748 epoxy 2	Comparison example		C	B	B	200	500	1000	1	100	1	2

NC = No change
1 = 1.5 mm swell in width and length
2 = 0.5 mm swell in width and length